# HOMICIDE IN THE WORKPLACE

# IN ONTARIO:

## Occupations at risk and limitations of existing data sources

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## ABSTRACT

This study has identified workplace homicides in Ontario from 1975 to 1985, described those at risk, and examined what existing data sources are most suitable for locating the occurrence of these events. Homicides were identified from two sources: the Office of the Chief Coroner and the Ontario Mortality Database (OMDB). Of the 84 homicides identified, 87% occurred among males; the average annual work-related homicide rates was 0.17 per 100,000 workers, with a male-to-female ratio of 5.2:1. The rates in males were about one-eighth of those reported in California and Texas. The highest rates occurred among policemen, gas station attendants, security guards, and taxi drivers, and in restaurants and in certain retail operations such as jewellery stores. These homicides represented about 4% of all traumatic workplace fatalities. Firearms were responsible for 56% of these homicides and the motive was robbery in 50%. The OMDB proved to be an awkward source from which to identify such deaths because there is no "injury-at-work" field on death certificates. Other existing sources of data were not able to locate work-related homicides. Guidelines to protect those at high-risk of assault and homicide should be developed.

## INTRODUCTION

Statistics concerning workers in the United States dying on the job by homicide, as well as from other traumatic causes, are available through the National Traumatic Occupational Fatality (NTOF) database established by the National Institute for Occupational Safety and Health (NIOSH).[1] NIOSH examined traumatic occupational fatalities in the U.S. during 1980-1984 and found that 11.2% of the 30,692 fatalities in males, and 42% of the 1740 fatalities in females during this period were homicides.[1] State-specific investigations in Maryland,[2] and more recently in California and Texas[3,4] indicate that work-related homicide is an important problem, with homicide rates among males of 2.2 and 2.1 per 100,000 workers in California and Texas, respectively, and that the problem has not been addressed by the Occupational Safety and Health Administration (OSHA).[5] In addition, NIOSH estimated that gunshots accounted for 4.5% of all work-related injury deaths in the U.S. during 1980-1981.[6] A report from the U.S. Bureau of Labour Statistics[7] indicated that 4% of occupational injury and illness fatalities among private employers with 11 employees or more during 1983-84 were due to assault; the highest proportions were in the service and wholesale and retail trade sectors.

In Canada, on the other hand, the data do not appear to be as readily obtained. A report from Labour Canada[8] described in detail the work fatality experience of Canadian workers including analyses by industry, by occupation, and by province. In tabulating fatalities by type of injury, there is merely a miscellaneous thirteenth and last category, consisting of "homicides, suicides, bites, stings, unspecified" which accounted for up to 4.5% of the approximately 800 to 1000 fatalities per year.

Tabulations were obtained from the Canadian Centre for Justice Statistics (Homicide Project)[9] for homicides in Ontario, 1975-1984, which numbered about 180 to 200 per year. The closest

this source could come to determining work-related homicides was to indicate the location of the homicides as one of the following: victim's home, suspect's home, correctional institution, mental institution, public place, other, unknown, and finally "other private or workplace" combined but the components of this last category could not be separated out.

One of the objectives of the Occupational Health and Safety Act in Ontario [Section 14(2)(g)] is to ensure that "... every precaution reasonable in the circumstances for the protection of a worker" is taken. No Ontario Government guidelines have been developed to increase the safety of those who are at risk of being murdered or assaulted during work-related activities. The study reported here was initiated to determine the extent of the problem of work-related homicide in Ontario, and to determine the industries and occupations most at risk. In the process, an attempt was made to determine which existing Ontario data sources are most useful in gathering these data, the limitations of these sources, and how occupational health and safety agencies are addressing the problem.

## METHODS

Two sources were used to identify work-related homicides. First, the Office of the Chief Coroner within the Ministry of the Solicitor General receives reports on all homicides and deaths from injury purposely inflicted (International Classification of Disease [ICD] 9th edition codes E960-969) in the province of Ontario since they are reportable deaths under the Coroners Act. Since these are classified according to the "environment" where the death occurred, work-related fatalities can be identified. All files so identified for the years 1975-1985 inclusive were reviewed and the following data were abstracted: date, motive, and method of assault, as well as age, sex, industry, and occupation of the victim.

The second source was the Ontario Mortality Database (OMDB). The ability to identify those homicides which took place in an industrial, office, or farm location, and to capture on death certificates whether injury occurred at work was assessed. Initially all homicides in the database (ICD 960-969) for 1975-1985 inclusive with place of location field coded as 1 (farm), 2 (mine or quarry), or 3 (industrial premise) were identified. The actual death certificates were then examined for evidence of events at work, especially the entry "How did injury occur? (describe details)". If this information suggested a possible or definite relation with work and the death was not already known from the Chief Coroner's Office, the file for the case at the Coroner's Office was reviewed to verify if such a connection existed, and if so, to abstract similar data on occupation, industry, and motive. It was observed that of the work-related homicides already identified from the Coroners' files, the place of occurrence field was coded in the OMDB as 5 (street/highway), 6 (public building) or 7 (residential institution) in greater than 50% of cases, although these locations might not instinctively be considered as workplaces. As a result, homicides in the OMDB with these codes were also identified and reviewed as described above.

To evaluate other possible existing data sources, the Workers' Compensation Board (WCB) and the Industrial Health and Safety Branch (IHSB) of the Ministry of Labour (MOL) were contacted to determine whether similar data were available.

The victims' occupation and industry information obtained from the Chief Coroner's files or from death certificates was coded into broad occupational and industrial categories corresponding to the 1980 Standard Occupational Classification[10] and the Standard Industrial Classification.[11] Population counts by sex, occupation, and industry for the Ontario workforce were obtained from tabulations from Statistics Canada for 1981 (the approximate mid-point of the time period of study).[12] The

numbers of individuals in specific occupations and industries of interest were obtained from the 1981 Census of Canada.[13,14]

## RESULTS

The Office of the Chief Coroner identified a total of 60 work-related homicides during the period 1975-1985. Of these, four were excluded on review: three fire fighters died fighting a fire at a factory/warehouse as a result of asphyxia and compression when they were buried under a mass of paper. A subsequent inquest into a charge of arson and three counts of criminal negligence in connection with the deaths led to an acquittal. In addition, one undercover Ontario Provincial Policeman who was to be a witness at murder and break-in trials was found shot at home but this event could not definitely be associated with work, leaving 56 deaths from this source.

There was no field in the OMDB or on Ontario death certificates that indicated "injury at work". A total of 275 homicides (not already known from the Coroners' files) with the six place of occurrence codes noted above were identified from the OMDB; of these, 49 were considered possibly work-related after examining the death certificates. On review of the Coroners' files for these deaths, 28 were considered definitely work-related, giving a total from the two sources of 84 deaths for analysis.

Of these 84 deaths from homicide identified, 73 (87%) were males; the average age was 41 years (range 16 to 77). The potential years of life lost due to these deaths was 2871 before age 75, and 2056 before age 65. The employed population of Ontario in 1981 was 4,464,000.[12] The 84 deaths represent an average annual work-related homicide rate of 0.17 per 100,000 workers. The homicide rate was 0.26 per 100,000 for males and 0.05 per 100,000 for females, a male-to-female ratio of 5.2:1 (Table I). The age-specific homicide rates, by sex, did not vary appreciably over the age ranges except in the 65+ males, but these rates are based on small numbers (Table I). The

number of homicides per year varied from 5 to 12 but was similar during 1975-79 and 1980-85 (mean 8.0 and 7.3 per year, respectively).

Homicides were confined mainly to the major industrial groupings of transportation, trade, service, and public administration in males; all female deaths occurred in trade and service industries (Table II). For males, specific industries with high homicide rates were (per 100,000) jewellery stores (14.6), taxicab operations (5.4), gas stations (3.2), and restaurants, caterers and taverns (1.1). Examples of other stores, shops and locations at which multiple homicides occurred included milk/ variety/ convenience stores, court room (victims were lawyers), ceramics store, butcher shop, community centre, and penitentiary.

The major occupational groups with the highest homicide rates were sales, service/recreation, transportation, and managers/ professionals in males, and sales and managers/professionals in females (Table III). More meaningful descriptions are obtained by examining rates for the high-risk occupations identified in males (Table IV). The rates were highest in gas station attendants, police, security guards, and taxi drivers (the latter is an underestimate because the denominator includes chauffeurs among whom no deaths occurred); all of these rates are more than 10 times the overall rate in males.

The weapon or method responsible for the homicide was gunshot in 47 (56%), beating in 17 (20%), stabbing in 14 (17%), and "other" in 6. Shooting was more commonly involved in deaths of policemen (10 of 13) and gas station attendants (6 of 8). The motive for the homicide was reported to involve robbery in 42 (50%) of the cases, insanity or psychiatric problems in 9, personal problems with the assailant (eg. money owed to an acquaintance) in 7, other motives in 17, and unknown in 9.

Determining the proportion of occupational fatalities due to homicide was problematic because first, the number of traumatic

fatalities per year in Ontario varied according to which reference was used (for example, WCB Allowed Claims; Advisory Council on Occupational Health and Occupational Safety Annual Reports; or WCB Initially Settled Claims); and second, some homicides may not be included in the denominator of "total traumatic fatalities" because they occurred in self-employed persons. Bearing these limitations in mind, using the annual average of about 190 injury fatalities during 1976-1985 according to WCB Allowed Claims data,[15] work-related homicides represented, as a crude proportion, about 4% of traumatic workplace fatalities.

The place of occurrence as coded in the OMDB was known for all but 5 of the homicides under study. This death location was coded as public building (in 42), street/highway (13), industrial premise (8), home (6), residential institution (3), others (3), or unspecified/missing (4). Of the 42 homicides coded to '6' (public building), the death certificates for 35 (83%) gave a definite indication that the injury was work-related and occurred at a work site. Moreover, of the 51 deaths initially identified from the Coroners' Office for which location codes were known, death certificates for 47 were coded to other than industrial premise. For 25 of these, there was sufficient information from the death certificate to indicate that the homicide was work-related and had occurred at a worksite (e.g. shop, store, restaurant); for 5, one could tell the work-relatedness of the event but the site was not a typical worksite (e.g. policeman shot in a home or shopping mall or taxi driver shot in his taxi); and for 17, there was inadequate information on the death certificate to determine whether the injury was work-related and at a worksite.

Data available from other sources: The Ministry of Labour could not provide statistics for work-related homicides. The reason given was that the inspectors from the industrial, construction, and mining branches of the MOL do not investigate homicides. As records are only kept for fatalities for which inspections were

performed, there are no homicide statistics generated. The WCB computerized data files could provide statistics on all workplace fatalities but the numbers or proportions due to homicide could not be identified from these databases.

## DISCUSSION

This study has identified industry, occupation, and gender categories for which the risk of workplace homicide for Ontario workers is high. Males are at greater risk than females, as is true of homicide in general. The male:female ratio of 5.2:1 for workplace homicides is similar to the ratio of 4.2:1 reported from California.[3]

The highest rates were found among police officers, taxi drivers, security guards, those working in various trade industries, especially retail (eg. jewellery stores), restaurant owners and employees, and gas station attendants, which are not surprising findings. Kraus[3] and Davis[4] examined workplace homicides in California and Texas, respectively, and reported similar observations. The high risk industries in their reports included gas stations, retail stores, food and dairy stores, and eating and drinking places; high risk occupations included police, taxi drivers, private security guards, and supervisors and proprietors (sales).

Higher rates in older males were found in Ontario; this observation was also made by Davis[4] who suggested as possible explanations that these workers may be viewed as more vulnerable targets or may be less likely than younger males to survive their injuries. Another possibility may be that the proportion of workers who keep working past age 65 may be higher for some high risk jobs, such as security guards, than for others. Evidence supporting this possibility was obtained from the 1981 Census.[13] For example, in Canada in 1981, males 65 years and over accounted for about 2.3% of the labour force 15 years and over, 3.1% of

service occupations, and 8.7% of "guards and related security occupations".

Magnitude of the problem:

The workplace homicide rates of 2.2 and 2.1 per 100,000 in males in California and Texas[3,4] were about 8 times that computed for Ontario males. This ratio is of the same order of magnitude as that for homicide as a whole between the countries (in 1981, the homicide rate was 10.4 per 100,000 among U.S. white males[16] and 2.0 per 100,000 among Ontario males[17]). Death rates for high risk groups were also higher in the U.S. studies (homicide rates among police of 20.8 and 25.7; taxi drivers 19.0 and 36.9; and security guards 16.5 and 11.0 per 100,000 in California and Texas males, respectively). However, the work-related homicides rates for these occupations in Ontario (Table IV) are, in some cases, proportionately higher, exceeding one-eighth of the corresponding U.S. rates.

Homicides accounted for 13% of traumatic workplace fatalities reported to NIOSH'S NTOF database[1] during 1980-84 compared with our crude estimate that about 4% of traumatic fatalities in Ontario resulted from homicide. Thus, the burden of illness due to homicide in the workplace expressed either in mortality rates or as a proportion of workplace traumatic fatalities is not as great as that in the U.S., which is not surprising given the portrayals via American media of homicide and other forms of violence. However, extrapolation of workplace homicides as a proportion of all homicides in Ontario (about 4.1% over the study period) to all homicides in Canada (592 in 1982[18]), suggests that this entity may be responsible for up to 24 deaths per year, which is not inconsequential.

Davis et al.[19] recently examined fatal occupational injuries of women in Texas during 1975 through 1984 and found that homicides accounted for 53% of these deaths. Sex-specific numbers of workplace traumatic injuries, 1976-1985, were available for Ontario for WCB initially settled fatal claims (provided by P.

Lewicki and W. Chan, WCB, January 1988). During this period, there were approximately 4 such fatal claims per year among women. The 11 work-related fatalities among women (or, on average, one per year) thus represent a significant proportion of traumatic occupational fatalities in women, comparable to that in Texas and in the NTOF.[1,19] In addition, certain groups of female workers are also at risk for assault that may not result in fatalities, as recently reported by Seligman et al. for sexual assault of women at work.[20] These investigators calculated that in Ohio during 1983-1985, the rape rate was 7.0 per 100,000 females employed in convenience stores per year, 25.6 times the rate for all females employed in Ohio.

Motive and weapon:

Robbery was the most frequent motive recorded in the Ontario work-related homicides. In Texas, robberies were involved in 48% of workplace homicides, which was similar to the 50% observed here. Firearms were more frequently involved in the U.S. studies (84% in Texas, 77% in California) than in Ontario (56%).

Limitations of existing data sources:

There is no definitive source as to the numbers of traumatic fatalities per year. An important finding of this study is the difficulty in easily identifying work-related homicides using existing data sources in Ontario. The Ministry of Labour, which is charged with workplace safety, has taken no role in keeping or acquiring such data, let alone suggesting or implementing changes to improve the work environment. An improved and complete reporting system for work-related homicide with input from the MOL may be of value. The WCB databases apparently could not be used at present to separate homicides from other fatalities. The tabulations available from Labour Canada did not readily separate occupational illness from injuries or provide breakdown of data by sex.

The files from the Coroners' Office proved to be the most useful because, by classifying the "environment" where the death occurred, workplace deaths could be identified. Baker et al[2] also found coroners records to be have a greater yield than death certificates. However, we identified only 56 (67%) of the work-related homicides from this source.

Death certificates proved to be awkward as a source for detecting work-related homicides. A minority (28 of 84) of workplace homicides not previously identified from the Coroner's office were found from the OMDB. The place of occurrence of accidents is coded by the Registrar General Branch of the Ministry of Consumer and Commercial Relations, according to that specified by the International Classification of Diseases.[21] The place of occurrence code is designed to indicate the location but not the work-relatedness of the event and thus, is not useful in identifying only those homicides occurring in the workplace. In addition, there were cases for which the physician completing the death certificate did not include adequate information regarding the work-relatedness of the event.

There is no "injury at work" field on Ontario death certificates. In contrast, the study groups for the California and Texas studies referred to above were primarily identified using computerized listings of death certificates. These death certificate listings were examined, scanning the fields "injury at work" (and in California, homicide at an industrial, office, or farm location). The field "Place of injury (e.g. home, farm, highway)" is present on Ontario death certificates but there is no field to denote injury at work.

Baker et al.,[2] in examining workplace deaths in Maryland, noted firearms and transportation as important causes of these injuries, and pointed out that these deaths involved hazards not addressed by the U.S. Occupational Safety and Health Act or occurred among workers in categories excluded from the Act. The Occupational Health and Safety Act in Ontario does not apply to

self-employed persons, such as owners/proprietors of small shops and restaurants who do not have additional employees; yet these persons are found among the groups at risk of being assaulted. Not only have no guidelines to prevent assault been developed, but the MOL does not keep records, and takes no part in investigations of work-related homicides.

Recommendations:

A number of recommendations can be made as a result of these observations. First, the current reporting system should be modified by the Ministry of the Solicitor General to ensure that it easily captures and categorizes as such all work-related homicides. This problem has been identified by the Office of the Chief Coroner and it is hoped that the measures undertaken through computerization which are currently being implemented will correct these deficiencies. Second, a better (national) reporting system should be established for all acute traumatic occupational injuries, such as that established by NIOSH.

Third, death certificates should be changed to provide an injury-at-work field, regardless of the location of accidental or traumatic death. Physicians completing death certificates should provide all available information regarding the work-relatedness of the event.

In addition, the MOL role should be changed to take an active role in the investigation of these homicides. In other words, the investigations should be carried out not only from the criminal justice aspect but also using the resources of the regulatory agencies responsible for workplace health and safety.

Finally, guidelines of practice based on recommendations to prevent these occurrences should be developed. Recommendations previously made[2,5,22] include calls for the use of protective equipment (bullet proof partitions, vests, helmets) for high risk employees; bullet proof vests for night-time workers with

access to money; and cash registers in full view of the street to show that very little money can be accessed by employees. Although ownership of firearms is less widespread in Ontario than in the U.S., over 50% of work-related homicides in this province involved shooting. In fact, this was considerably greater than the proportion of all homicides in Ontario during 1975-1984 involving shooting, which ranged from 22% to 37%.[9] Limiting access to handguns may also represent an area for prevention.

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## Table I

**Average Annual Work-Related Homicide Rates Per 100,000 Workers, By Sex and Age, Ontario, 1975 - 1985**

| Age Group (years) | MALES | | | FEMALES | | |
|---|---|---|---|---|---|---|
| | Number Workers* | Number Killed | Rate Per 100,000 | Number Workers* | Number Killed | Rate Per 100,000 |
| 15 - 19 | 249,000 | 4 | 0.15 | 227,000 | 0 | - |
| 20 - 24 | 336,000 | 6 | 0.16 | 298,000 | 1 | 0.03 |
| 25 - 44 | 1,198,000 | 35 | 0.27 | 888,000 | 6 | 0.06 |
| 45 - 64 | 743,000 | 23 | 0.28 | 443,000 | 4 | 0.08 |
| 65+ | 55,000 | 5 | 0.83 | 25,000 | 0 | - |
| All ages | 2,582,000 | 73 | 0.26 | 1,882,000 | 11 | 0.05 |

* Total numbers of workers may not correspond due to rounding. Numbers of workers are for 1981 employed population as reported in Reference 12.

Table II

Average Annual Work-Related Homicide Rates
Per 100,000 Workers, by Sex and Industry,
Ontario, 1975 - 1985

| | MALES | | | FEMALES | | |
|---|---|---|---|---|---|---|
| Industry | Number Workers* | Number Killed | Rate Per 100,000 | Number Workers* | Number Killed | Rate Per 100,000 |
| Agriculture & other primary | 165,000 | 0 | - | 55,000 | 0 | - |
| Manufacturing | 797,000 | 0 | - | 315,000 | 0 | - |
| Construction | 224,000 | 1 | 0.04 | 21,000 | 0 | - |
| Transportation & Communication | 236,000 | 6 | 0.23 | 76,000 | 0 | - |
| Trade | 383,000 | 26 | 0.62 | 333,000 | 8 | 0.22 |
| Finance | 98,000 | 0 | - | 157,000 | 0 | - |
| Service | 496,000 | 23 | 0.42 | 801,000 | 3 | 0.03 |
| Public Administration | 177,000 | 17 | 0.87 | 107,000 | 0 | - |
| Unclassified | 8,000 | 0 | - | 18,000 | 0 | - |
| **TOTAL** | 2,582,000 | 73 | 0.26 | 1,882,000 | 11 | 0.05 |

* Total numbers of workers may not correspond due to rounding. Numbers of workers are for 1981 employed population as reported in Reference 12.

Table III

Average Annual Work-Related
Homicide Rates Per 100,000 Workers
By Sex and Selected Occupational Divisions,
Ontario, 1975 - 1985

| | MALES | | | FEMALES | | |
|---|---|---|---|---|---|---|
| Occupation | Number Workers* | Number Killed | Rate Per 100,000 | Number Workers* | Number Killed | Rate Per 100,000 |
| Managerial, Professional | 594,000 | 17 | 0.26 | 425,000 | 5 | 0.11 |
| Clerical | 177,000 | 1 | 0.05 | 630,000 | 1 | 0.01 |
| Sales | 253,000 | 20 | 0.72 | 188,000 | 3 | 0.15 |
| Service, Recreation | 258,000 | 25 | 0.88 | 345,000 | 1 | 0.03 |
| Transportation | 141,000 | 5 | 0.32 | 13,000 | 0 | - |
| Processing, Manufacturing, Material Handling & Other Crafts | 747,000 | 5 | 0.06 | 213,000 | 1 | 0.04 |
| Other | 412,000 | 0 | - | 68,000 | 0 | - |
| TOTAL | 2,582,000 | 73 | 0.26 | 1,882,000 | 11 | 0.05 |

* Total numbers of workers may not correspond due to rounding. Numbers of workers are for 1981 employed population as reported in Reference 12.

Table IV

Average Annual Homicide Rates
Per 100,000 Male Workers in Specific Occupations,
Ontario, 1975 - 1985

| Occupation (Classification Code) | Number Workers* | Number Killed | Rate Per 100,000 |
|---|---|---|---|
| Gas Station Attendants (5145) | 10,825 | 7 | 5.9 |
| Police Officers and Detectives (6112) | 19,405 | 13 | 6.1 |
| Taxi Drivers and Chauffeurs (9173) | 8,540 | 5 | 5.3 |
| Guards and Related Security Occupations (6115) | 23,280 | 7 | 2.7 |

* From Reference 13.